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| APPLICATION NO.                | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--------------------------------|-------------|----------------------|---------------------|------------------|
| 10/811,705                     | 03/29/2004  | Yifan Gong           | TI-37146            | 1350             |
| 23494                          | 7590        | 07/19/2007           | EXAMINER            |                  |
| TEXAS INSTRUMENTS INCORPORATED |             |                      | STOFFREGEN, JOEL    |                  |
| P O BOX 655474, M/S 3999       |             |                      | ART UNIT            | PAPER NUMBER     |
| DALLAS, TX 75265               |             |                      | 2626                |                  |
| NOTIFICATION DATE              |             | DELIVERY MODE        |                     |                  |
| 07/19/2007                     |             | ELECTRONIC           |                     |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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|                              |                 |              |
|------------------------------|-----------------|--------------|
| <b>Office Action Summary</b> | Application No. | Applicant(s) |
|                              | 10/811,705      | GONG ET AL.  |
|                              | Examiner        | Art Unit     |
|                              | Joel Stoffregen | 2626         |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 29 March 2004.  
 2a) This action is FINAL. 2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-14 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-14 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 06 August 2004 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_.

## DETAILED ACTION

1. This action is in response to the original application filed on 03/29/2004. Claims 1-14 are currently pending in this application. Claim 1 is an independent claim.

### *Claim Objections*

2. **Claims 2, 3, 4, and 9** are objected to because of the following informalities:

Claims 2, 3, and 4 recite the use of "states". There is insufficient antecedent basis for this limitation in the claims.

Claim 2 recites the phrase "can be". It is unclear whether the limitation(s) following the phrase are part of the claimed invention.

Claim 9 recites the phrase "could be". It is unclear whether the limitation(s) following the phrase are part of the claimed invention.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claims 1, 6-9, 12, and 14** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the phrases “distribution parameter of the signals” and “a new observation of the signal” render the claim indefinite because it is unclear what signals are being used.

Regarding claim 6, the phrase “the incoming observed signals” renders the claim indefinite because it is unclear what signals are being used.

Regarding claim 7, the phrases “information derived from all signals” and “the incoming observed signals” render the claim indefinite because it is unclear what signals are being used.

Regarding claim 8, the phrase “the signal comprises a speech signal” renders the claim indefinite because it is unclear what signal is being used.

Regarding claim 9, the phrase “a new observation of the signals” renders the claim indefinite because it is unclear what signals are being used.

Regarding claim 12, the phrase “every fixed length” renders the claim indefinite because it is unclear what length of speech signal is used.

Regarding claim 14, the phrase “product of any sequence” renders the claim indefinite because it is unclear what the result of the product will be.

#### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. **Claims 1, 2, and 6-14** are rejected under 35 U.S.C. 102(b) as being anticipated by Tsuboka, Patent No. US 5,129,002 ("TSUBOKA").

7. Regarding **claim 1**, as best understood in view of claim rejection under 35 USC 112 2<sup>nd</sup> (see above), TSUBOKA teaches a method of updating bias of a signal model in a sequential manner (FIG. 7), comprising the steps of:

introducing an adjustable bias in the distribution parameter of the signals ("the mean of the probability density for generating the feature vector in the state within the same state may vary linearly", column 14, lines 48-50);

updating the bias every time a new observation of the signal is available ("calculates a new estimated value of the parameter in state i", column 14, lines 38-39); and

calculating the updated new bias by adding a correction item to the old bias ("calculate the cumulative sum of the denominators and numerators with respect to the training word pattern", column 14, lines 31-33).

8. Regarding **claim 2**, TSUBOKA further teaches that the bias can be defined on each HMM state ("calculates a new estimated value of the parameter in state i", column 14, lines 38-39).

9. Regarding **claim 6**, as best understood in view of claim rejection under 35 USC 112 2<sup>nd</sup> (see above), TSUBOKA further teaches that the correction term is calculated

based on the information of both current model parameters (“provided with proper values  $\lambda = \{\mu, u, \gamma, \Sigma\}$  as initial values”, column 14, lines 29-30) and the incoming observed signals (“training word pattern  $Wr$ ”, column 14, line 33).

10. Regarding **claim 7**, as best understood in view of claim rejection under 35 USC 112 2<sup>nd</sup> (see above), TSUBOKA further teaches that the correction term is calculated based on the information of both information derived from all signals provided to the recognizer (“provided with proper values  $\lambda = \{\mu, u, \gamma, \Sigma\}$  as initial values”, column 14, lines 29-30) and the incoming observed signals (“training word pattern  $Wr$ ”, column 14, line 33).

11. Regarding **claim 8**, as best understood in view of claim rejection under 35 USC 112 2<sup>nd</sup> (see above), TSUBOKA further teaches that the signal comprises a speech signal (see FIG. 7, “voice input”).

12. Regarding **claim 9**, as best understood in view of claim rejection under 35 USC 112 2<sup>nd</sup> (see above), TSUBOKA further teaches that new available data from a new observation of the signals could be based on any length (see column 14, lines 33-34, the length varies from one word to  $R$  words).

13. Regarding **claim 10**, TSUBOKA further teaches that new available data from a new observation is a frame ("input voice signal is converted into a sequence  $X=x_1, x_2, \dots, x_T$  of feature vectors, in  $T$  is the number of frames", column 1, lines 25-27).

14. Regarding **claim 11**, TSUBOKA further teaches that new available data from a new observation is an utterance (see column 14, lines 33-34, the calculation is based on an utterance of one word to  $R$  words).

15. Regarding **claim 12**, as best understood in view of claim rejection under 35 USC 112 2<sup>nd</sup> (see above), TSUBOKA further teaches that new available data from a new observation is every fixed length of speech signal (see column 14, lines 33-34, the length varies from one word to  $R$  words).

16. Regarding **claim 13**, TSUBOKA further teaches that new available data from a new observation is every 10 minutes of speech signal (see column 14, lines 33-34, the length varies from one word to  $R$  words,  $R$  being an arbitrary value that represents any length of time, depending on how many words are spoken and how quickly they are spoken).

17. Regarding **claim 14**, TSUBOKA further teaches that the correction is the product of any sequence whose limit is zero, whose summation is infinity and whose square summation is not infinity (see column 13, equations on lines 5-19, the terms are in the

form of  $1/N$ ) and the summation of the quantities weighted by a probability, the quantities are based on the divergence of desired model parameter and observed signal (see column 13, equations on lines 5-19,  $P(wr | \lambda)$ ).

***Claim Rejections - 35 USC § 103***

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. **Claims 3, 4, and 5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuboka, Patent No. US 5,129,002 ("TSUBOKA"), in view of Chien et al., Patent No. US 6,662,160 ("CHIEN").

20. Regarding **claim 3**, TSUBOKA teaches all of the claimed limitations of claim 1. However TSUBOKA does not disclose that bias is shared among different states. In the same field of model adaptation, CHIEN teaches a bias that is shared among different states ("bias compensation vector  $b(\lambda)$  is shared by all HMM units", CHIEN, column 4, lines 58-59).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the bias vector of CHIEN with the model adaptation method of TSUBOKA in order to avoid a "data sparseness problem" (CHIEN, column 4, line 61).

21. Regarding **claim 4**, CHIEN further teaches that the bias is shared by groups of states ("bias compensation vector  $b(\lambda)$  is shared by all HMM units", CHIEN, column 4, lines 58-59).

22. Regarding **claim 5**, CHIEN further teaches that that the bias is shared by all the distribution of a recognizer ("bias compensation vector  $b(\lambda)$  is shared by all HMM units", CHIEN, column 4, lines 58-59).

### ***Conclusion***

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. A list of the pertinent prior art can be found on the included form PTO-892 Notice of References Cited.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joel Stoffregen whose telephone number is (571) 270-1454. The examiner can normally be reached on Monday - Friday, 9:00 a.m. - 6:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JS



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